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MA/KSC APOLLO PROGRAM DIR.

Kennedy Space Center
APOLLO PROGRAM DIRECTIVE

Date: November 1, 1966

KSC APOLLO PROGRAM DIRECTIVE NO. 6

TO: Distribution

FROM: Apollo Program Manager

SUBJECT: KSC Apollo Unsatisfactory Condition and Corrective Action Reporting

REFERENCE: See Attachment A

I. PURPOSE

To establish Apollo unsatisfactory condition reporting and feedback requirements at KSC consistent with Apollo program objectives and requirements.

II. SUPERSESSIONS

KSC Technical Standard Operating Procedure No. 2 dated 10 March 1964 will be cancelled by appropriate action by the Procedures Branch, Center Administrative Services Office, effective the date of this directive.

III. GENERAL

A. All unsatisfactory conditions discovered in flight related and launch related equipment will be reported, documented, and corrected in a timely and effective manner. Unsatisfactory conditions include design, quality, operational, and procedural problems in flight, launch and launch related equipment.

B. Each KSC and contractor organization responsible for design, operation, checkout and maintenance of such equipment is responsible for assuring compliance with this directive and for preparing the necessary implementing guidelines.

C. Each problem reported must have corrective action and closeout to assure closed-loop reporting, commensurate with its potential impact on mission success.

D. Reporting of unsatisfactory conditions on KSC hardware starts during integration and system testing (whether accomplished at a contractor's plant or on-site at KSC).

E. Reporting of unsatisfactory conditions on MSC or MSFC hardware (or hardware supplied by their contractors) begins when the equipment comes under KSC's cognizance.

F. KSC Apollo unsatisfactory condition reporting shall meet the requirements of NPC 200-2, Section 14 and NPC 250-1, Section 3.7 and other applicable NASA requirements.

IV. SCOPE

This directive is applicable to the following organizations:

A. KSC

Apollo Program Manager

Director of Technical Support
Director, Information Systems
Director, Support Operations

Director of Launch Operations
Director, Launch Vehicle Operations
Director, Spacecraft Operations

Director of Installation Support

Director of Design Engineering

Director, Quality Assurance

B. Contractors (Operational and/or Maintenance Responsibility)

CCSD	Grumman	RCA
DAC	AC Electronics	PAA
IBM	G.E. (ACE)	TWA
Boeing	Bendix	NAA
		FEC

C. Contractors (Design Responsibility)

CCSD	G.E.
Boeing	DOW

V. PROGRAM REQUIREMENTS

A. Discrepancy Record (DR)

1. When unsatisfactory conditions are encountered, the immediate objective is to obtain disposition action within 24 hours. Disposition action is defined as that action required to immediately dispose of a problem or to arrive at a plan or course of action to allow normal work to proceed.

2. Discrepancy Record, KSC Form 4-21, or an equivalent form shall be used to record the problem and to record the subsequent completion of disposition action. Requests for use of an equivalent form shall be submitted to the Apollo Program Office for approval. Disposition action is complete when inspection buy-off on the DR indicates hardware fixes and paper work has been accomplished.

3. Section II of K-AM-050/1 is the recording guide for Discrepancy Records.

B. Unsatisfactory Condition Report (UCR)

1. The UCR is used to document all failures and unsatisfactory conditions having an effect or potential effect on the mission in order to obtain rapid resolution and corrective action. It serves a secondary purpose, in conjunction with the DR, to insure recurrence control on subsequent space vehicles and GSE.

2. UCRs shall be issued within a maximum of three working days after problem occurrence. KSC Form 14-14 or an equivalent form will be used. Requests for use of an equivalent form shall be submitted to the Apollo Program Office for approval.

3. Section III of K-AM-050/1 is the recording guide for UCRs.

C. Corrective Action Report (CAR) Requirements

1. Corrective action is defined as those measures or steps taken (such as design changes, fabrication process changes, etc.) to prevent an unsatisfactory condition from recurring.

2. Corrective action determination is generally a responsibility of the cognizant design organization. An exception is a procedural

quality or human problem attributed to operations; this is a responsibility of the cognizant operational contractor and/or KSC operational organization to correct.

3. Corrective action shall be initiated by the cognizant design organization so that changes can be made to eliminate future problems, wherever possible, an assessment will be made of what work-around actions are necessary to assure readiness to support a launch.

4. All UCRs written on Priority I, II, or III KSC hardware shall be answered on KSC Form 14-14B, Investigation and Corrective Action, by the responsible design organization within five working days after receipt; all other UCRs shall be answered within ten working days after receipt. When corrective action cannot be determined within these time frames, an interim report shall be issued indicating the planned corrective action and an estimated date of completion.

5. UCRs on KSC hardware are transmitted by the operational organization or its contractor to the KSC design organization or its contractor. Copies of UCRs are also transmitted to the cognizant R&QA groups.

6. Corrective action reports will be transmitted to the operating KSC and contractor organizations to effect a closed-loop reporting system.

7. Section III of K-AM-050/1 is the recording guide for 14-14B, Investigation and Corrective Action.

D. Closeout Action

1. UCRs documenting hardware failures and requiring hardware modification shall be considered closed for recurrence control when required hardware modifications are incorporated, the system is verified as operational, and the problem documented on the UCR has been eliminated. All other UCRs shall be considered closed for recurrence control after verification by the operational organization that the required action has been taken.

2. The cognizant operating organization shall concur in the disposition of problems considered by the design organization as not requiring recurrence control action. Differences will be submitted to DA with sufficient background, for resolution.

3. Recurrence control action required of a vendor shall be considered closed by the cognizant design organization upon

verification that the problem has been eliminated in subsequent vendor hardware shipments.

4. When recurrence control action provided by the responsible design organization does not correct the problem reported on the UCR, the UCR shall not be closed. The operational organization is responsible for follow-up action, my memorandum, to the responsible design organization (with a copy to DA) explaining the reason for requesting further action.

VI. RESPONSIBILITIES

A. Apollo Program Manager is responsible for:

1. Establishing KSC Apollo unsatisfactory condition reporting requirements.

2. Assuring that all elements of KSC, including support contractors, have adequate Apollo unsatisfactory condition reporting procedures to assure prompt and continuous reporting and processing of data.

3. Assuring KSC has prompt and adequate closed-loop reporting to provide assessment for both launch readiness purposes and to prevent recurring problems.

4. Establishing overall guides, as required, to assure effective system implementation (including coding guidelines for computer storage and retrieval of data).

5. Serving as the focal point for unsatisfactory conditions which require Apollo program committal action by MSC or MSFC.

6. Assuring the DR and UCR forms are kept current, to fulfill the needs of Apollo reporting and investigating functions.

B. Operational organizations are responsible for:

1. Developing in-house procedures to implement this directive and monitoring the reporting procedures of the respective KSC contractors for compliance with KSC Apollo requirements.

2. Assuring their respective contractors document and report all unsatisfactory conditions.

3. Validating the open or closed status of each unsatisfactory condition.

4. Developing necessary procedures for shipping failed items to a designated "HOLD" area to await disposition by the design organization.

5. Verifying final recurrence control closure action of all unsatisfactory conditions.

6. Validating that flight readiness action has been taken on all unsatisfactory conditions occurring at KSC.

7. Identifying their contractors' flight readiness open items to the Apollo Program Manager.

C. Design Engineering organizations are responsible for performing (or assuring mission design contractors listed in Paragraph IV.C perform) the following:

1. Investigating unsatisfactory conditions and specifying corrective action to prevent recurrences.

2. Providing a timely review and assessment of those reports identified by the operational organizations (or operational support contractors) as being potential or actual launch restraints; determining design work-arounds that may be required for flight readiness.

3. In conjunction with the operational organization and the R&QA organization supporting the operation, determining:

   a. Degree of failure analysis for the hardware.

   b. Place analysis is to be conducted.

   c. Requirements for items which are to receive failure analysis.

4. Assuring corrective action is carried out in the form of engineering changes (E O's, drawing changes, specification changes, etc.).

D. Quality Engineering and Control Division is responsible for:

1. Assuring unsatisfactory conditions which occur on KSC hardware during systems integration or buy-off at a contractor plant are documented on a KSC Form 14-14, or equivalent, commensurate with contract requirements.

2. On KSC designed hardware, assisting Design Engineering by investigating quality problems, and recommending corrective action.

3. Generating Discrepancy Records (or equivalent reports) for all KSC procured hardware receiving inspection activities, and determining trends.

4. Assuring corrective action is carried out on KSC designed hardware quality problems in the form of revised inspection procedures, revised manufacturing methods, or other appropriate actions.

E. Operating organizations are responsible for assuring that contractors, as listed in Paragraph IV.B will:

1. Establish a system for inspection and documentation of unsatisfactory conditions in equipment utilizing KSC Discrepancy Report Form 4-21 or equivalent, commensurate with contract requirements.

2. Coordinate the place and degree of failure analysis (with the appropriate design organization through the cognizant KSC operational organization) for hardware which requires hardware analysis prior to launch.

3. Transmit failed hardware that will not constrain a launch to a designated "HOLD" area. The cognizant design organization responsible for investigation of the problem shall determine the place and degree of hardware analysis.

4. Prepare Unsatisfactory Condition Reports or equivalent, commensurate with contract requirements.

5. Code KSC Form 14-14 for computerization and assign priority numbers (as defined in Section III and IV of K-AM-050/1) to unsatisfactory condition reports.

6. Follow closeout status of reports and assure the reports are not closed out for flight readiness or recurrence control until corrective action has been accomplished.

7. Distribute the reports within the time limit and with the required number of copies specified in each contract.

8. Maintain and submit to the line directorates bi-weekly corrective action (recurrence control) status of anomalies and failures experienced showing association with a particular launch. The status will show by system:

a. Total reports received.

b. Total reports closed by R&QA.

c. Reports concurred by customer.

d. Reports open for FRR.

e. Reports open for recurrence control.

9. Submit report(s) to KSC every two weeks identifying those priority items which require review, analysis, disposition action or corrective action by the cognizant design organization. This will include the potential schedule impact and what design action is needed. This report shall be submitted weekly after spacecraft and vehicle mate and daily after the Countdown Demonstration Test to keep KSC apprised of problems for launch and flight readiness purposes.

ATTACHMENT A

Reference:

(a) NHB 5300.1, Apollo Reliability and Quality Assurance Program Plan.

(b) NPC 250-1, Reliability Program Provisions for Space System Contractors.

(c) NPC 500-1, Apollo Configuration Management Manual.

(d) NPC 500-10, Apollo Test Requirements.

(e) NHB 7500.1, Apollo Logistics Requirement Plan.

(f) NMI 5310.1, Reporting of NASA Parts and Materials Application Problems.

(g) NMI 8020.3A, Manned Space Flight Flash Reports.

(h) MA 1400.006, Sequence and Flow of Hardware Development and Key Inspection, Review and Certification Checkpoints, Apollo Program Directive No. 6.

(i) MA 1400.007, Apollo Design Certification Review, Apollo Program Directive No. 7.

(j) MA 2210.008, Apollo Flight Readiness Reviews, Part 1, Apollo Program Directive No. 8.

(k) MP 9330.047, MSF Program Reviews.

(l) NMI 8621.1, Mission Failure Investigation Policy & Procedures.

(m) NPC 200-2, Quality Program Provisions for Space System Contractors.

(n) K-AM-050/1, Guide for Preparing
- Discrepancy Records.
- Unsatisfactory Condition Reports.
- Investigation and Corrective Action Reports.

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